

**FEEDFORWARD PREDICTION OF SCALEFACTORS BASED  
ON ALLOWABLE DISTORTION FOR NOISE SHAPING IN  
PSYCHOACOUSTIC BASED COMPRESSION**

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**5    ABSTRACT OF THE DISCLOSURE**

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A method of encoding a digital signal, particularly an audio signal, which predicts favorable scalefactors for different frequency subbands of the signal. Distortion thresholds which are associated with each of the frequency subbands of the signal are used, along with transform coefficients, to calculate total scaling values, one for each of the frequency subbands, such that the product of a transform coefficient for a given subband with its respective total scaling value is less than a corresponding one of the distortion thresholds. In an audio encoding application, the distortion thresholds are based on psychoacoustic masking. The invention may use a novel approximation for calculating the total scaling values, which obtains a first term based on a corresponding distortion threshold, and obtains a second term based on a sum of the transform coefficients. Both of these terms may be obtained using lookup tables. The total scaling values can be normalized to yield scalefactors by identifying one of the total scaling values as a minimum nonzero value, and using that minimum nonzero value to carry out normalization. Encoding of the signal further includes the steps of setting a global gain factor to this minimum nonzero value, and quantizing the transform coefficients using the global gain factor and the scalefactors.